



A-2984
B. Sc. (Sem. III) Examination
March / April – 2015
Physics : Paper - IV
(For Electronics)
(New Course)

Time : Hours]

[Total Marks : 50

Instructions :

(1)

<p style="text-align: center;">नीचे दृष्टावेक निशानीवाणी विगतो उत्तरवही पर अवश्य लिखवी. Fillup strictly the details of signs on your answer book.</p> <p>Name of the Examination : B. Sc. (Sem. III)</p> <p>Name of the Subject : Physics : Paper - IV (For Electronics) (New Course)</p> <p>Subject Code No. : <input type="text" value="2"/> <input type="text" value="9"/> <input type="text" value="8"/> <input type="text" value="4"/> Section No. (1, 2,.....) : <input type="text" value="Nil"/></p>	<p>Seat No. :</p> <table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"><tr><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td><td style="width: 15%;"></td></tr></table> <div style="border: 1px solid black; border-radius: 15px; height: 80px; display: flex; align-items: center; justify-content: center; margin-top: 10px;">Student's Signature</div>						

- (2) Draw neat diagram wherever necessary.
- (3) Symbols used have their usual meaning.
- (4) Figures to the right indicates full marks of the question.
- (5) Scientific calculator may be used.

1 Answer the following questions in brief : 8

- (1) What is meant by an aberration in a lens ?
- (2) Define Astigmatism.
- (3) What is dispersive power ?
- (4) What are seidal sums ?
- (5) What is optical activity.
- (6) Define polarized light.
- (7) Define principle section of the crystal.
- (8) Define specific rotation.

2 (a) Obtain and expression for the dispersive power of a lense ? Find the condition for achromatism of a combination of two thin coaxial lense (i) when in contact and (ii) when separated by a distance. 10

- (b) Calculate the focal length of a convex lens of crown glass (dispersive power 0.012) and a concave lens of flint glass (dispersive power 0.020) so that when placed in contact they form an achromatic converging combination of focal length 30 cm. 4

OR

- 2 (a) Enumerate the various defects of image formation by an optical system. Explain the method of removing them. 10
- (b) The focal length of an achromatic combination of two lenses in contact is 150 cm. If the dispersive powers of the materials of the two lenses are 0.018 and 0.027. Calculate the focal length of the two lenses. 4
- 3 (a) Describe how, with the help of a Nicol prism and a quarter wave plate, plane polarized light, circularly polarized light and elliptically polarized light are produced and detected. 10
- (b) Calculate the thickness of double refracting plate capable of producing a path difference of $\frac{\lambda}{4}$ between extraordinary and ordinary wave. Given $\lambda = 5890 \text{ \AA}$, $\mu_o = 1.53$, $\mu_e = 1.54$. 4

OR

- 3 (a) What is double refraction ? Give the Huygens theory of double refraction in uniaxial crystals. 10
- (b) Calculate the thickness of half wave plate of quartz for wavelength of 5000 \AA , $\mu_e = 1.553$, $\mu_o = 1.544$. 4
- 4 Write short notes on : (any two) 14
- (1) Absorption spectroscopy
 - (2) Determination of refractive index
 - (3) Quarter wave plate
 - (4) Optical rotation due to magnetic and electric field.